

# Biology (Course 7)

Department of Biology

## Bachelor of Science in Biology

### General Institute Requirements (GIRs)

The General Institute Requirements include a Communication Requirement that is integrated into both the HASS Requirement and the requirements of each major; see details below.

#### Summary of Subject Requirements

	Subjects
Science Requirement	6
Humanities, Arts, and Social Sciences (HASS) Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied from among 5.12 or 5.60 or 5.601/5.602, and 7.03 or 7.05 in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 7.002 and 7.003[J] in the Departmental Program]	1
<b>Total GIR Subjects Required for SB Degree</b>	<b>17</b>

#### Physical Education Requirement

Swimming requirement, plus four physical education courses for eight points.

### Departmental Program

Choose at least two subjects in the major that are designated as communication-intensive (CI-M) to fulfill the Communication Requirement.

Required Subjects	Units
5.12 Organic Chemistry I	12
5.60 Thermodynamics and Kinetics <sup>1</sup> or 20.110[J] Thermodynamics of Biomolecular Systems	12
7.002 Fundamentals of Experimental Molecular Biology	6
7.003[J] Applied Molecular Biology Laboratory (CI-M)	12
7.03 Genetics	12
7.05 General Biochemistry or 5.07[J] Introduction to Biological Chemistry	12
7.06 Cell Biology	12
<b>Biology Capstone Subject</b>	
7.19 Communication in Experimental Biology (CI-M) <sup>2</sup>	12
<b>Restricted Electives</b>	
Select three undergraduate-level 12-unit subjects offered by the Department of Biology for which 7.03 and/or 7.05 are prerequisites. <sup>3</sup>	36
<b>Units in Major</b>	<b>126</b>
<b>Unrestricted Electives</b>	<b>90</b>
Units in Major That Also Satisfy the GIRs	(36)
<b>Total Units Beyond the GIRs Required for SB Degree</b>	<b>180</b>

The units for any subject that counts as one of the 17 GIR subjects cannot also be counted as units required beyond the GIRs.

<sup>1</sup> The department recommends 5.60 or 20.110[J] to fulfill this component of the program, but it will also accept 2.005 Thermal-Fluids Engineering I, 8.044 Statistical Physics I, or 10.213 Chemical and Biological Engineering Thermodynamics. The combination of 5.601 Thermodynamics I and 5.602 Thermodynamics II and Kinetics is also an acceptable option.

<sup>2</sup> See list of Communication-Intensive Subjects in the Major below for acceptable alternatives.

<sup>3</sup> Exceptions: 7.30[J] Fundamentals of Ecology is eligible as a restricted elective; 7.19 cannot be counted as a restricted elective. Graduate-level subjects may not be used as restricted electives.

### Restricted Electives

7.08[J] Fundamentals of Chemical Biology	12
7.093 Modern Biostatistics & 7.094 and Modern Computational Biology	12
7.20[J] Human Physiology	12
7.21 Microbial Physiology	12
7.23[J] Immunology	12
7.26 Molecular Basis of Infectious Disease	12
7.27 Principles of Human Disease and Aging	12

7.28	Molecular Biology	12
7.29[J]	Cellular and Molecular Neurobiology	12
7.30[J]	Fundamentals of Ecology	12
7.31	Current Topics in Mammalian Biology: Medical Implications	12
7.32	Systems Biology	12
7.33[J]	Evolutionary Biology: Concepts, Models and Computation	12
7.37[J] or 7.371	Molecular and Engineering Aspects of Biotechnology Biological and Engineering Principles Underlying Novel Biotherapeutics	12
7.45	The Hallmarks of Cancer	12
7.46	Building with Cells	12
7.49[J]	Developmental Neurobiology	12
9.17	Systems Neuroscience Laboratory (CI-M) <sup>1,2</sup>	12
9.26[J]	Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience	12

<sup>1</sup> 9.17 can be used as a restricted elective or CI-M, not both.

<sup>2</sup> Subject has prerequisites that are outside of the program.

### Communication-Intensive Subjects in the Major

7.003[J]	Applied Molecular Biology Laboratory (CI-M)	12
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Choose one of the following options:

9-18

*Option A (Course 7 Capstone, recommended by the Biology Department)*

7.19	Communication in Experimental Biology (CI-M)
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*Option B*

Select one of the following:

6.129[J]	Biological Circuit Engineering Laboratory (CI-M)
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8.13	Experimental Physics I (CI-M) <sup>1</sup>
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9.12	Experimental Molecular Neurobiology (CI-M) <sup>1</sup>
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9.17	Systems Neuroscience Laboratory (CI-M) <sup>1,2</sup>
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9.28	Current Topics in Developmental Neurobiology (CI-M) <sup>1</sup>
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10.26	Chemical Engineering Projects Laboratory (CI-M) <sup>1</sup>
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10.27	Energy Engineering Projects Laboratory (CI-M) <sup>1</sup>
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10.28	Chemical-Biological Engineering Laboratory (CI-M) <sup>1</sup>
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10.29	Biological Engineering Projects Laboratory (CI-M) <sup>1</sup>
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20.109	Laboratory Fundamentals in Biological Engineering (CI-M) <sup>1</sup>
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20.380	Biological Engineering Design (CI-M) <sup>1</sup>
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<sup>1</sup> Subject has prerequisites that are outside of the program.

<sup>2</sup> 9.17 can be used as a restricted elective or CI-M, not both.